

COMPLETE LISTING OF CLAIMS, INCORPORATING AMENDMENTS
IN RESPONSE TO OFFICE ACTION DATED 10/06/2006
FOR SERIAL NUMBER 10/828,534

We claim the following:

1. (original) A carbon nanotube-polymer composite actuator comprising:
 - at least one electrolyte;
 - at least two electric conducting electrodes separated by said at least one electrolyte;
 - and
 - at least one electrode providing an electromechanical response upon application of an electronic voltage between said at least two electric conducting electrodes.
2. (original) The carbon nanotube-polymer composite actuator of claim 1, wherein at least one of the electrodes comprises a carbon nanotube-polymer composite.
3. (original) The carbon nanotube-polymer composite actuator of claim 2, wherein the carbon nanotube-polymer is between 0.1-18 weight percent single wall carbon nanotubes.
4. (original) The carbon nanotube-polymer composite actuator of claim 2, wherein the carbon-nanotube composite is prepared by polymer processing material techniques.
5. (original) The carbon nanotube-polymer composite actuator of claim 2, wherein the carbon-nanotube composite is prepared by the following method
 - preparing a carbon nanotube-polymer solution;
 - casting the carbon nanotube-polymer solution, forming a carbon nanotube-polymer composite;
 - drying the carbon nanotube-polymer composite;
 - doping the carbon nanotube-polymer composite with a metal;
6. (original) The carbon nano-tube polymer composite actuator of claim 5, wherein the nano-tube polymer solution is prepared by mixing: a polymer, carbon nanotubes and a liquid, wherein the polymer is soluble or dispersible in the liquid.

7. (original) The carbon nanotube-polymer composite actuator of claim 6, wherein the carbon nano-tubes are single wall carbon nanotubes.
8. (original) The carbon nanotube-polymer composite actuator of claim 6, wherein the polymer is selected from the group consisting of: ionomers, smart gels, polyelectrolytes, ionic polymers, ionically doped polymers, and combinations thereof.
9. (original) The carbon nanotube-polymer composite actuator of claim 6, wherein the polymer is a perfluorinated ionomeric polymer.
10. (original) The carbon nanotube-polymer composite actuator of claim 6, wherein the liquid is an alcohol.
11. (currently amended) The carbon nanotube-polymer composite actuator produced by the process of claim 5, the process further comprising: high shear stirring the carbon nanotube-polymer solution before casting.
12. (currently amended) The carbon nanotube-polymer composite actuator produced by the process of claim 5, the process further comprising: homogenizing the carbon nanotube-polymer solution before casting.
13. (currently amended) The carbon nanotube-polymer composite actuator produced by the process of claim 5, the process further comprising: centrifuging the carbon nanotube polymer solution before casting.
14. (original) The carbon nano-tube polymer composite actuator of claim 5, wherein the metal is selected from the group consisting of: platinum, gold, copper and combinations thereof.
15. (original) The carbon nanotube-polymer composite actuator of claim 1, wherein the electrolyte is selected from the group consisting of: monovalent metal ions, polyvalent metal ions and combinations thereof.

16. (original) The carbon nanotube-polymer composite actuator of claim 5, where the carbon nanotube is a multi wall nanotube, a nanohorn or other fibrous carbon nanostruct[er]ured material.
17. (original) The carbon nanotube-polymer composite actuator of claim 5, wherein the composite is produced by a technique selected from the group consisting of: melt polymerization, extrusion, and solution casting.
18. (original) The carbon nanotube-polymer composite actuator of claim 5, wherein the actuator is capable of operating in aqueous, non-aqueous, gel, or solution free environments.
19. (original) The carbon nanotube-polymer composite actuator of claim 5, wherein the electro-chemical response includes an osmotic mechanism.
20. (original) The carbon nanotube-polymer composite actuator of claim 5, further comprising a surfactant applied to the actuator.
21. (original) The carbon nanotube-polymer composite actuator of claim 5, wherein at least one electrode is a ceramic.
22. (original) The carbon nanotube-polymer composite actuator of claim 1 where at least one of the electrodes is comprised of nanostructured materials.